

WHAT IS CLAIMED IS:

1. A liquid discharge apparatus for forming pixels composed of a predetermined number of dots disposed in pixel areas on a recording medium according to a liquid discharge signal, the liquid discharge apparatus comprising:

a head including a plurality of liquid dischargers having nozzles aligned in a predetermined direction;

a deflecting unit for deflecting the trajectory of a droplet discharged from one of the liquid dischargers in a predetermined direction and commanding at least two of the liquid dischargers in the vicinity to discharge droplets onto the same pixel area;

a storing unit for storing information on a discharge failure of the liquid dischargers; and

a controlling unit for controlling the liquid discharge signals sent to the liquid dischargers and the deflecting unit according to the information stored in the storing unit.

2. A liquid discharge apparatus for forming pixels composed of a predetermined number of dots disposed in pixel areas on a recording medium according to a liquid discharge signal, the liquid discharge apparatus comprising:

a head including a plurality of liquid dischargers having nozzles aligned in a predetermined direction;

a deflecting unit capable of deflecting the trajectory of a droplet discharged from the liquid discharger with various amplitudes along a predetermined direction and for discharging droplets from at least two of the liquid dischargers in the vicinity onto the same pixel area;

a storing unit for storing information on discharge failure, wherein the storing unit stores information on a liquid discharger shut-off due to discharge failure;

an alternative discharge unit for discharging droplets alternatively, wherein the alternative discharge unit transfers at least a part of a liquid discharge signal directed to the shut-off discharger to at least one of the other liquid dischargers according to the information stored in the storing unit and controls the discharge of droplets from at least one of the other liquid dischargers that the transferred received liquid discharge signal.

3. A liquid discharge apparatus for relatively moving a recording medium and a head in a direction substantially perpendicular to a predetermined direction and for forming pixels composed of a predetermined number of dots disposed in pixel areas on the recording medium according to a liquid discharge signal during the relative movement, the liquid discharge apparatus comprising:

a head including a plurality of liquid dischargers

having nozzles aligned in a predetermined direction;

a discharge deflecting unit capable of deflecting the trajectory of a droplet discharged from the liquid discharger with various amplitudes along the predetermined direction, the deflecting unit discharging droplets from at least two of the liquid dischargers in the vicinity onto the same pixel area, and discharging droplets from a liquid discharger selected from among the liquid dischargers capable of discharging droplets onto a pixel area for a pixel composed of a predetermined number of dots;

a storing unit for storing information on discharge failure, wherein the storing unit stores information on a liquid discharger shut-off due to discharge failure;

an alternative discharge unit for discharging droplets alternatively, wherein the alternative discharge unit transfers at least a part of a liquid discharge signal directed to the shut-off discharger to a free time slot, in which no discharge of droplets is commanded, of at least one of the other liquid dischargers according to the information stored in the storing unit and controls the liquid dischargers receiving the liquid discharge signal to discharge droplets onto the same landing position as the shut-off liquid discharger during the free time slot according to the transferred liquid discharge signal.

4. A liquid discharge apparatus according to claim 3, capable of discharging droplets onto a position $\pm(1/2 \times P) \times N$ distant from the center of the liquid discharger in a predetermined direction, where N is a positive integer and P is the alignment pitch of the liquid dischargers in the alignment direction.

5. A liquid discharge apparatus according to claim 3, wherein liquid discharge signals for forming a dot row in the direction of the relative movement are sent one after another to at least two of the liquid dischargers capable of discharging droplets on a landing position corresponding to the liquid discharge signal, and wherein the dot row is formed by discharging droplets from at least two of the liquid dischargers in a predetermined direction according to the liquid discharge signals.

6. A liquid discharger according to claim 3, wherein the processing of a discharge signal for forming a dot row in the direction of relative movement is controlled by sharing the signal for selecting the liquid discharger and the signals for controlling the trajectory of the discharged droplet or by synchronizing one of the signals with the other signal.

7. A liquid discharge apparatus according to claim 3, wherein the generation of the liquid discharge signal for forming a dot row in the direction of the relative movement is controlled to generate a liquid discharge signal in a normal mode not involving the shut-off liquid discharger and a liquid discharge signal in a compensation mode involving the shut-off liquid discharger for transferring the liquid discharge signal to at least one of the other liquid dischargers disposed in the vicinity of the shut-off liquid discharger.

8. A liquid discharge apparatus according to claim 3, wherein the liquid discharge signals have time slots for the maximum number of discharge commands corresponding to one pixel area, and wherein the time slots for at least a portion of the discharge commands for the liquid discharge signal sent to the shut-off liquid discharger are added to the original time slots.

9. A liquid discharge apparatus according to claim 3, wherein the liquid discharge signals have time slots for the maximum number of discharge commands corresponding to one pixel area, wherein the time slots for at least a portion of the discharge commands for the liquid discharge signal sent to the shut-off liquid discharger are added to the original

time slots, and wherein the speed of the relative movement is $1/(\text{new pixel formation cycle}/\text{original pixel formation cycle})$.

10. A liquid discharge apparatus according to claim 3, wherein the disposition of the discharge commands to the time slots of the liquid discharge signal is controlled by taking a reference line close to the center of the time slot and allocating the discharge commands alternatively on both side of the reference line.

11. A method for discharging liquid through a head including a plurality of liquid dischargers having nozzles aligned in a predetermined direction, wherein the head is capable of deflecting the trajectory of a droplet discharged from the liquid discharger with various amplitudes along a predetermined direction and for discharging droplets from at least two of the liquid dischargers in the vicinity onto the same pixel area, the method comprising the steps of:

relatively moving a recording medium and the head in a direction substantially perpendicular to the predetermined direction,

forming a pixel composed of a predetermine number of dots by discharging a predetermine number of droplets from the liquid dischargers during the relative movement,

storing information on a shut-off discharger due to droplet discharge failure among the plurality of liquid dischargers,

transferring at least a part of a liquid discharge signal directed to the shut-off discharger to at least one of the other liquid dischargers according to the information stored in the storing unit, and

controlling the discharge of droplets from at least one of the other liquid dischargers to which the liquid discharge signal was transferred.

12. A method for discharging liquid through a head including a plurality of liquid dischargers having nozzles aligned in a predetermined direction, wherein the head is capable of deflecting the trajectory of a droplet discharged from the liquid discharger with various amplitudes along the predetermined direction and for discharging droplets from at least two of the liquid dischargers in the vicinity onto the same pixel area, the method comprising the steps of:

relatively moving a recording medium and the head in a direction substantially perpendicular to the predetermined direction,

forming a pixel composed of a predetermine number of dots by discharging a predetermined number of droplets from the liquid dischargers during the relative movement,

discharging droplets from at least two of the liquid dischargers in the vicinity onto the same pixel area, and for discharging droplets from a liquid discharger selected from among the liquid dischargers capable of discharging droplets onto a pixel area for a pixel composed of a predetermined number of dots,

storing information on a shut-off discharger due to droplet discharge failure among the plurality of liquid dischargers,

transferring at least a part of a liquid discharge signal directed to the shut-off discharger to a free time slot, where no discharger of droplets is commanded, for at least one of the other liquid dischargers according to the information stored in the storing unit, and

controlling the liquid dischargers receiving the liquid discharge signal to discharge droplets onto the same landing position as the shut-off liquid discharger during the free time slot according to the transferred liquid discharge signal.